

DEPARTMENT OF TRANSPORTATION - DISTRICT 7  
SPECIAL PROVISION "C" - EXCAVATION & BACKFILL  
7-96

This Special Provision "C" is to be used as minimum specifications for excavating and backfilling within State right of way.

I. EXCAVATION WITHIN ROADWAY:

1. Pipes crossing the roadway shall normally be jacked or otherwise forced underneath pavement without disturbing same. Pavement or roadway shall not be cut unless specifically allowed by the permit. Service pipes will not be allowed inside of culverts used as drainage structures.

2. Permittee shall comply with all State and local safety codes relative to safety measures for protection of workers in trenches and excavations (State of California Administrative Code, Title 8).

3. All excavations shall be shored and/or tight sheeted in accordance with Cal OSHA requirements.

4. Work shall not be permitted in confined spaces until all possible hazardous gases and vapors have been purged. Workers shall be equipped with adequate blowers, safety harnesses, hard hats, ropes, ladders and any other equipment necessary. When working in confined spaces, Cal OSHA requirements shall be adhered to.

5. Service connections shall be installed perpendicular to the center line of the State highway.

6. When the permit authorizes installation by open-cut method, not more than one lane of the highway shall be open-cut at any one time unless otherwise approved by the State permit inspector. After the pipe is placed in the open section, the trench is to be backfilled and temporary repairs made or bridged in accordance with the specifications and this portion shall be opened to traffic before the pavement is cut for the next section.

Temporary asphalt pavement patches, a minimum of 75mm(3") thick, shall be placed and maintained in a smooth riding surface free of humps or depressions.

7. Hazardous pipeline potholing clause (petroleum distillates, gas, electricity, chorine, etc.):

The permittee shall furnish Caltrans with the results of this exploration, having the location and grade shown to within 30mm (0.1') tied to State's datum, and certified by a licensed land surveyor or civil engineer, registered in the State of California.

8. Pavement (portland cement concrete and asphalt concrete) shall be sawcut to full depth by means of a concrete saw to provide a neat

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and straight edge along both sides of the trench. An unfractured pavement joint and rigid bonding of pavement replacement shall also be provided.

All residue, caused by the sawcutting, should be vacuumed or removed by other method, as approved by the State permit inspector and disposed of outside of State right of way.

9. Where the edge of the trench is within 0.6m (2') of existing curb or gutter, the pavement between the trench and the curb or gutter shall be removed and replaced.

10. A minimum lateral clearance of 1.5m (5') shall be provided between the edge of excavation and adjacent traffic lanes. Where 1.5m (5') of clearance is not provided, the excavation shall be shored. In no case shall the clearance be less than 0.9m (3').

11. Banks of open-cut trenches shall be kept as nearly vertical as possible. Trenches shall not be more than 600mm (24") wider than the outside diameter of the pipe to be laid therein, plus the necessary width to accommodate shoring.

12. All open trenches within the traveled way shall be backfilled, compacted and temporary pavement placed before the end of the working day.

Shoring and properly placed and maintained steel plates may be substituted for backfilling when authorized by the State permit inspector. See page 6 of this special provision: Temporary Steel Plate Bridging.

13. Trenches shall not be excavated more than 90m (300') in advance of pipe laying and shall not be left open more than 60m (200') in the rear thereof.

14. Tree roots over 50mm (2") in diameter shall not be cut unless otherwise authorized and approved by the State permit inspector.

15. If it becomes impractical to protect all roots over 50mm (2") in diameter or more than 40% of all roots will be damaged, permittee or permittee's contractor shall make special arrangements with the State permit inspector to remove, relocate or replace subject trees.

16. Manholes and vaults shall not be constructed within 6m (20') of any parkway tree.

## II. BACKFILL

1. Structural backfill within the existing or proposed roadbed area

shall be compacted in horizontal layers not exceeding 200mm (8") in thickness using approved hand, pneumatic or mechanical type tampers to obtain a relative compaction of 95% using California Test Method 216F. Structural backfill outside of slope lines and not beneath the roadbed shall be compacted to a relative compaction of 90%. Backfill material shall have a sand equivalent value of not less than 20 as determined by California Test Method 217F, if the excavation falls within the existing or proposed roadbed. Consolidation by ponding and jetting will be permitted when, as determined by the inspector, the backfill is of such character that it will be self-draining when compacted, and the foundation materials will not be softened or be otherwise damaged by the applied water and no damage from hydrostatic pressure will result. Ponding and jetting of the upper 1.2m (4') below finished grade is prohibited. When ponding and jetting is permitted, material for use as structural backfill shall be placed and compacted in layers not exceeding 1.2m (4 ft) in thickness. Ponding and jetting methods shall be supplemented by the use of vibratory or other compaction equipment when necessary to obtain the required compaction.

2. Backfill material may consist of 83kg/m<sup>3</sup> (1-1/2 sack/CY) sand-cement slurry. Accelerator (ie. calcium chloride) may be used when authorized by the State permit inspector. Slurry shall be vibrated in accordance with Section 40-107A of the Caltrans Standard Specifications as required by the State permit inspector.

3. Where it is necessary to tunnel under existing curb and gutter, sidewalk, or underground facilities, the void shall be backfilled and vibrated with sand-cement slurry.

4. By accepting this permit, the permittee agrees to pay all laboratory costs in connection with the necessary tests which may be required by the State permit inspector to determine the sand equivalent value of the backfill material or the trench backfill compaction. The frequency of such tests shall be at a minimum of one test per 450m (1500 ft) of continuous trench, or at locations determined by the State permit inspector, at elevations of not less than every 0.6m (2 ft) of backfill depth. A minimum of one test is required for each trench.

5. Prior to starting the trench backfill, the permittee shall make the necessary arrangements with a Caltrans certified materials testing laboratory to conduct the tests with certification from a civil engineer registered in the State of California.

### III. PERMANENT PAVEMENT REPAIRS

1. Repairs to PCC pavement shall be made within 5 working days of completion of backfill and shall be made of Class 2 portland cement concrete containing a minimum of 350kg/m<sup>3</sup> (5 sack/CY). Replacement of PCC pavement shall equal existing pavement thickness. The concrete shall

be satisfactorily cured and protected from disturbance for not less than 48 hours. High early strength concrete may be required at the discretion of the permit inspector.

2. Concrete sidewalks or curbs shall be cut to the nearest score marks and replaced equal in dimensions to that removed with score marks matching existing adjacent sidewalk or curb or as directed by the State permit inspector.

3. Repairs to AC pavements shall be made within 5 working days of completion of backfill and shall be made with Type B asphalt concrete meeting State specifications.

4. Replacement of the roadway structural section (pavement, base, subbase, etc.) shall be equal or better in all respects to the thickness and materials in the best portions of the existing structural section. Minimum thicknesses shall be 150mm (6") asphalt concrete on 200mm (8") base.

#### IV. REQUIRED MARKERS

Underground installations of pipes, cables, and conduits may be required to have surface markings showing the location of the underground facility. When markings are required, the permittee shall submit a marking plan for approval by the State permit inspector. Markings shall not interfere with vehicular traffic.

#### V. CATHODIC PROTECTION

The permittee shall perform stray current interference tests on underground utilities under cathodic protection. The permittee shall notify Caltrans prior to the tests and perform any necessary corrective measures recommended by Caltrans.

#### VI. HIGHWAY STRUCTURES

The permittee shall pay for any damage to highway structures caused by gas mains or other pipe lines carrying flammable. This includes, but is not limited to, explosion or fire resulting from such installations regardless of causation. If repairs are not feasible, complete replacement of structure may be necessary. The permittee will indemnify and hold the State harmless from any and all claims for injury to persons or damage to property resulting from such installation.

#### VII. TUNNELING

Except in effecting emergency repairs on utilities, no tunneling will be permitted. Major installations may be exempt as specifically set forth

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by the permit.

#### VIII. UNDERGROUND FACILITIES

All underground facilities shall be in accordance with the Caltrans "Manual on High and Low Risk Underground Facilities Within Highway Rights of Way". Unless otherwise authorized, pipes and conduits shall be installed in a manner to provide a minimum clearance of 1.1m (42") between the top of pipe and finished surface.

